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Matti Mäntymäki
Turku Centre for Computer Science, Turku School of Economics, matti.mantymaki@utu.fi

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Matti Mäntymäki

Turku Centre for Computer Science (TUCS)

Turku School of Economics, Finland

matti.mantymaki@tse.fi

Abstract

Social virtual worlds (SVWs) are an emerging phenomenon in terms of numbers of users as well as business environments. When it comes to the economic viability of SVWs, keeping existing customers active, i.e. customer loyalty, is a sine qua non. In this paper we investigate customer loyalty with two key variables: continuous use intention and purchase intention. We apply the expanded expectation-confirmation model by Thong et al. (2006) and empirically test our research model with data collected from 965 Canadian SVW users. Structural equation modelling is used to analyse the data. Perceived enjoyment was found to have the strongest impact on continuous use intentions whereas perceived critical mass was the main predictor of purchase intention. Finally, contrary to previous studies, satisfaction did not have a statistically significant impact on loyalty.

Keywords: social virtual worlds, customer loyalty, enjoyment

1 Introduction

Virtual worlds have become increasingly popular places for social interaction. For example, the number of hours spent in Second Life per quarter since 2006 has risen constantly, reaching 112 million hours in Q4 2008. Club Penguin, a virtual environment targeting users aged between six and 14 was reported to have 12 million subscriptions in 2007, before being acquired by Walt Disney Corporation. Moreover, virtual environments are becoming increasingly lucrative business environments. For example,

the users of Second Life spent more than USD 100 million on virtual goods and services during Q4 2008.[1] Additionally, the growing number of users has made virtual worlds interesting for advertisers.

Social virtual worlds (SVWs) can be considered a subset of virtual worlds, distinct from game worlds such as World of Warcraft. Moreover, SVWs are persistent computer-mediated communities that simulate an environment and use elements of gaming. (Bartle 2003.) In contrast to games, SVWs have no narrative goals or tasks that users need to accomplish. Apart from the element of game immersion, SVWs could be compared to virtual communities, "social aggregations that emerge from the net when enough people carry on those public discussions long enough, with sufficient human feeling, to form webs of personal relationships in cyberspace" (Rheingold, 2000). In contrast to more "traditional" online communities, SVWs contain graphic elements such as avatars and a 3D virtual space in which the users can move.

To be economically viable, SVWs need to generate revenue either from users or from alternative sources. SVWs can e.g. collect access fees or charge for periodical subscriptions. If the revenue model applied is not based on access fees or subscriptions, SVWs can charge their users for value-added features or services. Alternatively, the revenue model can be based on advertising, as in the case of TV, newspapers and other forms of mass media. For advertisers, the value of an SVW as an advertising medium is largely dependent on the number people the advertiser wishes to target. In practice, the revenue model is often a combination of e.g. user fees and advertising.

In this paper, we empirically investigate Habbo, which is the world's largest SVW for teenagers with its 11.5 million unique monthly visitors.[2] Habbo collects no access fees but offers virtual furniture for decorating user-generated virtual rooms, tickets for playing in-world games, and premium memberships providing members with additional benefits that are not available to non-subscribers. All these can be bought with Habbo credits, virtual currency purchased with real-life money. In a business that relies on access fees, commercials and premium services, the social outcomes, extended play and loyalty that result from members' engagement with the SVW are translated directly into monetary value. (Hagel & Armstrong 1997; Humpreys 2008.)

As a result, similarly to several other online services (Bhattacherjee 2001b; Gefen 2002; Reichheld et al. 2000), attracting and retaining existing users – i.e. maintaining customer loyalty – is a paramount issue for Habbo's revenue model. In this paper, we investigate loyalty in terms of two dependent variables: continuous use intention and purchase intention. Continuous use is essential since it is the users who generate the social interaction that comprises the core of SVWs. Therefore, a sufficient base of

1 Linden Labs, "Second Life Residents logged nearly 400 million hours in 2008, growing 61% over 2007" (retrieved 5 February 2009 at http://blog.secondlife.com/category/economy/)

2 Sulake Corporation, "Habbo - Where else", 2008 (retrieved February 5, 2008, http://www.sulake.com/habbo/?navi=2).

active users is needed to reach the critical mass required to make engagement with the SVW meaningful. Achieving the critical mass and creating the social interaction and network would be very challenging, if not impossible, if users would visit the SVW only once and then stop using it. Purchase intention has been positioned as the other dependent variable since purchasing value-added products or services is the only way in which users generate direct revenue for Habbo.

The post-purchase behaviour of consumers, including customer loyalty, has been voluminously discussed in consumer behaviour literature (Churchill & Surprenant 1982; Oliver 1997; Oliver 1999). The importance of customer loyalty has also been addressed in the field of e-commerce (Anderson & Srinivasan 2003; Bhattacherjee 2001a; Chang & Chen 2008; Cyr et al. 2007). Customer loyalty in virtual communities (Lin 2007; Lin et al. 2008) as well as online games (Choi & Kim 2004; Hsu & Lu 2004; Lu & Wang 2008; Yang et al. 2009) have recently been investigated. However, studies focusing particularly on loyalty in the SVW context have thus far been relatively scarce.

This calls for research to improve understanding of the motives for engaging with SVWs. To fill the abovementioned gap in the literature, we apply the IS continuance model by Bhattacherjee (2001b) and the expanded expectation-confirmation model by Thong et al. (2006), as we empirically investigate the two selected aspects of customer loyalty in the SVW context, i.e. continuous use intention and purchase intention.

The present paper contributes to the current literature firstly by extending the scope of consumer behaviour research into a new context that has not yet been exhaustively investigated. Secondly, by empirically investigating and measuring the impact of several potential determinants of loyalty, the paper attempts to identify paths for further research.

2 Background

Numerous studies in marketing have investigated why consumers continuously engage with certain brands or services. (Churchill & Surprenant 1982; Oliver 1999.) The importance of continuous consumption and loyalty for the economic success of companies has been widely acknowledged (cf. Helgesen 2006). The presence of the Internet has further underscored the importance of retaining existing customers (cf. e.g. Reichheld et al. 2000).

Understanding technology acceptance is a prominent field of research in IS literature (cf. e.g. Sun & Zhang 2006; Venkatesh 2003). Research on technology acceptance has traditionally focused more on the initial acceptance of information technology than on subsequent user behaviours. However, post-adoption behaviours and customer loyalty have emerged as an increasingly important topic in recent literature on IT acceptance and e-commerce (cf. Bhattacherjee 2001a; Bhattacherjee 2001b; Limayem et al., 2007; Reichheld et al. 2000; Thatcher & George 2004). The theoretical framework of the present paper draws on works by Bhattacherjee (2001b) and Thong et al. (2006), thus having its theoretical origins in the consumer behaviour and IS literature.

The expectation-disconfirmation theory of consumer behaviour postulates that a consumer's satisfaction with a product or service is determined by disconfirmation, i.e. the discrepancy between expectations and perceived performance. (Oliver & Linda 1981.) When performance is in line with expectations, then expectations are confirmed.

If performance is better or worse than expected, the expectations are positively or negatively disconfirmed. As a result, these expectations evolve for the better or for the worse over time based on the perceived performance. (Churchill & Surprenant 1982.)

According to Benbasat and Zmud (2003), the usage context of the IT artefact is an important factor in explaining user behaviour. The use context of SVWs differs, of course, from that of organisational computing in many ways. Firstly, the use of SVWs is related to free time and leisure rather than to work and productivity, which underscores the importance of hedonic motivation (van der Heijden 2004). Secondly, the use of SVWs is voluntary. Finally, social motives are particularly significant in the SVW context, since it is the presence of other users which makes the use of SVWs meaningful. The research model presented below, based on the expanded expectation-confirmation model presented by Thong et al. (2006), with some modifications, aims to clarify the characteristics of the SVW use context. The original model by Thong et al. (2006) draws on the expectation-confirmation model by Bhattacherjee (2001b) and has its theoretical basis in the expectation-disconfirmation theory as well as in the technology acceptance model.

For the present paper, the model by Thong et al. (2006) was supplemented by an additional dependent variable, purchase intention, since purchasing premium services is a source of revenue for the SVW in question. Finally, since SVWs are generally used to interact with other people, social aspects must be considered when determining the use of SVWs. Drawing on Metcalfe's law, it can be postulated that the number of users in very general terms increases the value of a SVW for its users. We follow e.g. Lou et al. and investigate perceived critical mass, which is a user's subjective evaluation of the proportion of his or her friends using the SVW (Lou et al. 2000.).

Since the present paper is one of the first attempts to understand customer loyalty in the context of SVWs, we have included more variables and relationships than would perhaps have been necessary to present the most parsimonious model. By doing this, we attempt to provide a fairly comprehensive illustration of customer loyalty and its determinants in the context of SVWs. The research model and the hypotheses associated with it are presented in the following chapter.

3 Research model and hypotheses

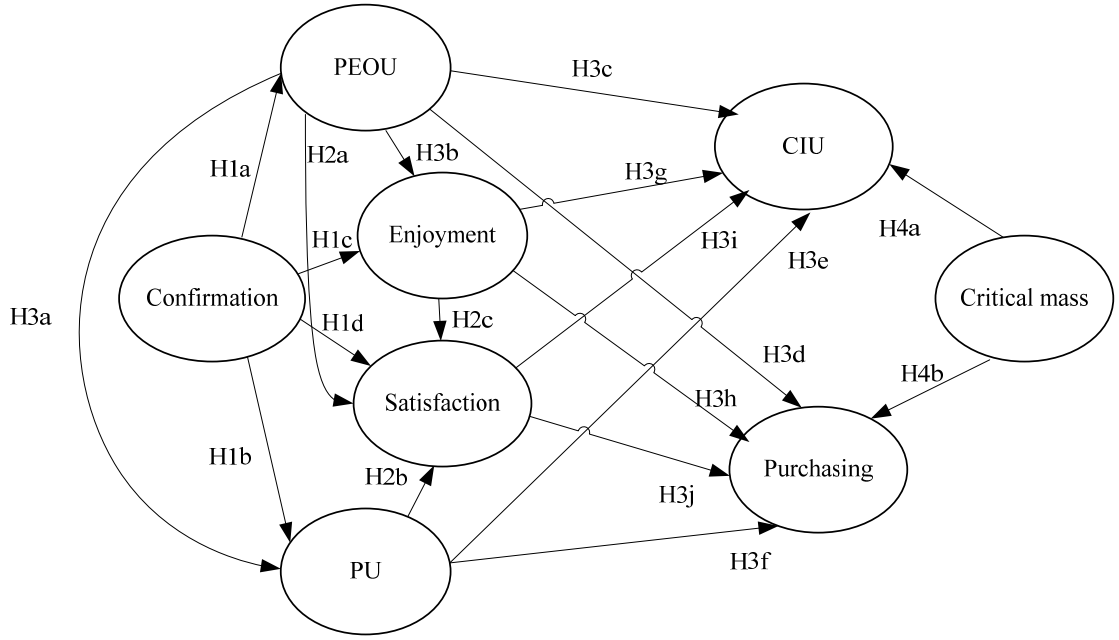

Figure 1: The research model

As argued in the expectation-confirmation model of IS continuance by Bhattacherjee (2001b), perceived usefulness is viewed as a post-adoption perception. Thong et al. (2006) have extended the model with two additional post-adoption expectations, namely perceived ease of use and perceived enjoyment. Based on the expectation-disconfirmation theory, these three post-adoption expectations are determined by confirmation. Moreover, satisfaction is determined by disconfirmation, i.e. the difference between a consumer's expectations and actual perceived performance. Following Bhattacherjee (2001a; 2001b) and Thong et al. (2006), we use the term confirmation, since in consumer behaviour literature it is often used interchangeably with disconfirmation. As a result, the first set of hypotheses is postulated as follows:

H1. A: Confirmation positively affects perceived ease of use.

B: Confirmation positively affects perceived usefulness.

C: Confirmation positively affects perceived enjoyment.

D: Confirmation positively affects satisfaction.

In the works of Bhattacherjee (2001b) and Thong et al. (2006), perceived usefulness, ease of use and enjoyment are viewed as post-adoption expectations. In studies using the technology acceptance model (TAM), perceived usefulness, ease of use and enjoyment have been positioned as antecedents of attitude. Centefelli et al. (2008) argue that attitude and satisfaction can be viewed as isomorphic constructs when they have over time reached a stable phase. As in earlier studies, satisfaction is used in place of attitude in the research model. (cf. e.g. Limayem et al., 2007; Bhattacherjee, 2001a; 2001b; Thong et al., 2006, Cenfetelli et al., 2008.)

H2. A: Perceived ease of use positively affects satisfaction.

B: Perceived usefulness positively affects satisfaction.

C: Perceived enjoyment positively affects satisfaction.

According to technology acceptance model (TAM), perceived usefulness and ease of use influence the use intention both directly and indirectly via attitude (Davis 1989.). Moreover, perceived enjoyment has been reported to have a positive influence on use intention (Dickinger et al. 2008; Ha & Stoel 2008; van der Heijden 2004). Thus, we hypothesise that our other dependent variable, purchase intention, is similarly positively influenced by perceived usefulness, ease of use and enjoyment. In contrast to Thong et al. we hypothesise that perceived ease of use (PEOU) has a positive impact on perceived enjoyment as, we argue, in order to be enjoyable, using an SVW must be easy.

H3. A: Perceived ease of use positively affects perceived usefulness.

B: Perceived ease of use positively affects perceived enjoyment.

C: Perceived ease of use positively affects continuous use intention.

D: Perceived ease of use positively affects purchase intentions.

E: Perceived usefulness positively affects continuous use intention.

F: Perceived usefulness positively affects purchase intention.

G: Perceived enjoyment positively affects continuous use intention.

H: Perceived enjoyment positively affects purchase intention.

In their respective studies, Bhattacherjee (2001a; 2001b) and Thong et al. (2001) have argued that satisfaction positively affects continuous use intention (Cenfetelli et al. 2008; Limayem et al. 2007). It is also generally acknowledged in the consumer behaviour literature that satisfaction is a major determinant of customer loyalty (Oliver, 1997; 1999).

I: Satisfaction positively affects continuous use intention.

J: Satisfaction positively affects purchase intention.

The role of social influence in technology acceptance has been voluminously discussed (cf. e.g. Karahanna et al., 1999; Venkatesh 2000). As SVWs are designed for social interaction, social motives will presumably be particularly relevant in this context. Drawing on Metcalfe's law, the number of relevant other users can, generally speaking, be seen as increasing the value that a SVW will have for its users. In the present study, we use the concept of perceived critical mass introduced by Lou et al. (Li et al. 2005; Lou et al. 2000). As in the works of Hsieh et al. (2008) and Lou et al. (2000), perceived critical mass is operationalised as the degree to which a person believes that most of his or her peers are using the innovation in question. In contrast to the subjective norm, perceived critical mass captures the aggregate personal network exposure (cf. Hiseh et

al. 2008). Results from earlier studies reveal that perceived critical mass has both a direct and an indirect influence on behavioural intention (Van Slyke 2007). In the current study we focus only on the direct effect.

H4. A: Perceived critical mass positively affects continuous use intention.

B: Perceived critical mass positively affects purchase intention.

4 Empirical research

4.1 Data collection

The data was collected using an online survey which was published in the Canadian Habbo portal. The Habbo users log into their local portal and each portal has its own specific content. The survey was opened 1,654 times and completed in 1,203 of these cases, making the response rate approximately 73%. In order to ensure the best possible quality of the report, only fully completed responses were included in the analysis. As a result, 965 fully completed and usable cases were retained for the analysis. 536 of the respondents were male, equalling 55.8%. 17 years was the mode age, in mathematical terms, with 8.6%, followed by 16 with 7.3%.

4.2 Measurement model

To asses the model fit and construct validity, data analysis began with a confirmatory factor analysis (CFA) of the measurement model, using AMOS 7.0 software. Each scale item was modelled as a reflective indicator. With the exceptions of satisfaction and perceived critical mass, the items were measured using a seven-point Likert scale anchoring from 1) strongly disagree to 7) strongly agree. Satisfaction was measured using a semantic scale based on Ajzen's model (1991). The operationalisations of the constructs can be seen in Appendix 1.

The convergent validity was evaluated on the basis of three criteria: 1) all indicator factor loadings should be significant and exceed 0.7; 2) composite reliabilities should exceed 0.80; and 3) average variance extracted (AVE) by each construct should be greater than the variance due to measurement error (AVE > 0.50) (Fornell & Larcker 1981). Composite reliabilities ranged from 0.839 to 0.95 and AVE values from 0.632 to 0.768. Finally, all item loadings in the CFA model exceeded 0.7 and were significant at 0.001 level. Thus, the conditions for convergent validity were met.

Table 1: Construct validity

	Loading	Composite reliability	AVE
SAT1	0,83	0,937	0,760
SAT2	0,867		
SAT3	0,921		
SAT4	0,933		
CIU1	0,915	0,924	0,632
CIU2	0,939		
PURCH1	0,863	0,934	0,713
PURCH2	0,933		
PURCH3	0,929		
PEOU1	0,774	0,855	0,665
PEOU2	0,827		
PEOU3	0,839		
PU1	0,892	0,839	0,698
PU2	0,918		
PU3	0,822		
CON1	0,896	0,924	0,707
CON2	0,903		
CON3	0,889		
ENJ1	0,918	0,950	0,768
ENJ2	0,931		
ENJ3	0,899		
ENJ4	0,887		
CM1	0,869	0,881	0,681
CM2	0,851		
CM3	0,809		

The square root of the AVE for each construct should exceed the correlation between that and any other construct. Table 3 indicates that the highest correlation between any pair of constructs was 0.693 (between confirmation and enjoyment). Thus, the test of discriminant validity was also met (Fornell & Larcker 1981).

Table 2: Correlations between the constructs (diagonal elements are square roots of AVEs)

	SAT	CIU	PURCH	PEOU	PU	CON	ENJ	CM
SAT	**0,872**							
CIU	0,236	**0,795**						
PURCH	0,233	0,482	**0,844**					
PEOU	0,28	0,434	0,283	**0,816**				
PU	0,372	0,487	0,378	0,416	**0,836**			
CON	0,424	0,646	0,465	0,512	0,582	**0,841**		
ENJ	0,448	0,616	0,354	0,521	0,625	0,693	**0,876**	
CM	0,267	0,29	0,376	0,179	0,51	0,411	0,328	**0,825**

After the convergent and discriminant validity was found to be acceptable, the goodness-of-fit of the CFA model was investigated. Given that the large sample size would substantially inflate the chi-square, neither chi-square statistics nor the normed chi-square (CMIN/df=3.76) were used. Once the fit for the measurement model was

found to be satisfactory, we tested the structural model (Gefen et al. 2000; Hu & Bentler 1999). The model fit indices are presented in Table 3.

Table 3: Model fit statistics

Fit index	Measurement model	Structural model
GFI	0.972	0.900
AGFI	0.904	0.872
TLI	0.961	0.943
SRMR	0.027	0.063
NFI	0.957	0.940
CFI	0.968	0.951
RMSEA	0.053	0.065

4.3 Structural model results

Of the 19 hypothesised paths, 16 were significant at 0.05 level, providing support for their hypotheses. PEOU did not have a significant impact on satisfaction. PU was found to be a very weak predictor of satisfaction. Thus H2a was rejected and H2b can only be partially supported.

Enjoyment was found to be the strongest predictor of continuous use intention, followed by PEOU and PU. Perceived critical mass had only a minor impact. However, perceived critical mass was the strongest determinant of purchase intention. Surprisingly, satisfaction did not have a statistically significant impact on either continuous use intention or purchase intention and, as a result, H3i and H3j were rejected. Figure 2 summarises the results from the path analysis.

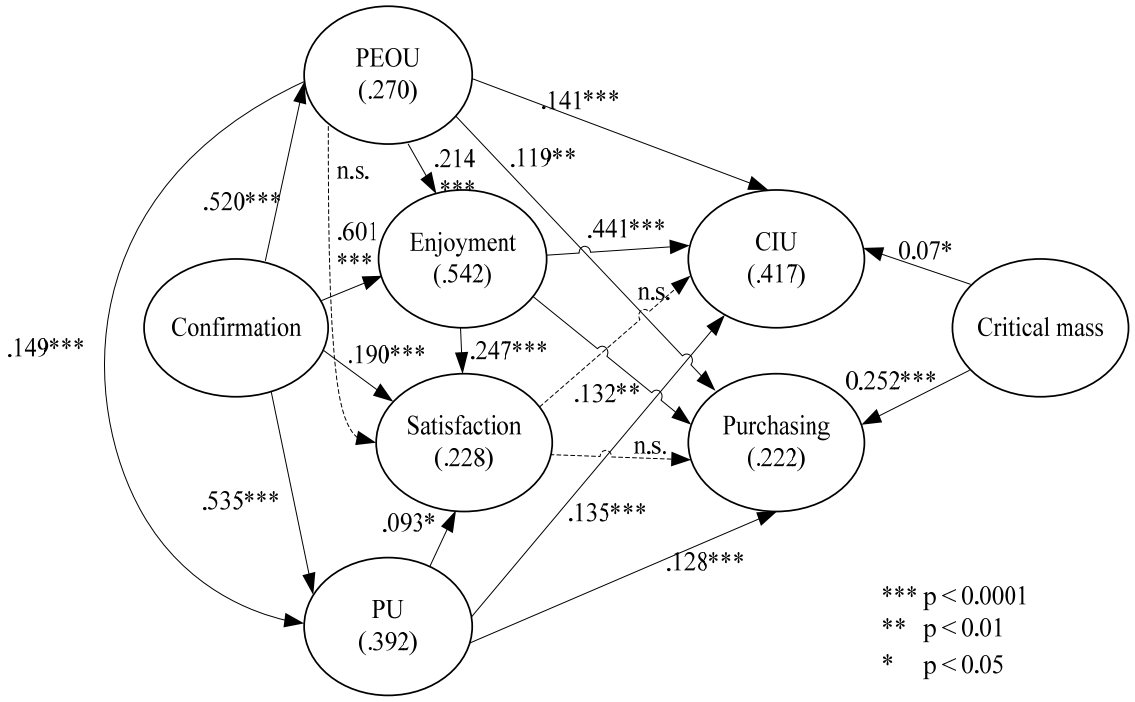

Figure 2: Results from the structural model

5 Discussion

5.1 Findings

The explanatory power found in this study for continuous use intention, at approximately 40%, is similar or below what has been found in earlier studies (Kim et al. 2007; Limayem et al. 2007; Thong et al. 2006). On the other hand, compared to the study by Lu and Wang on online game loyalty the explanatory power is fairly good (Lu & Wang 2008). As regards purchase intention, evaluating explanatory power is more problematic due to a lack of previous studies on purchase intentions in the context of SVWs. Given the fact that the research model included more variables and paths than many previous studies, the explanatory power measured for continuous use intention was somewhat surprising. On the other hand, as the present study was one of the very first attempts to uncover loyalty-related user behaviour in the context of SVWs, the results provide a starting point for the development of a better research model.

Enjoyment was found to be an important predictor of continuous use whereas perceived critical mass had the strongest impact on purchase intentions. In this regard the results are in line with other studies emphasising the role of enjoyment in IT use and acceptance decisions (Dickinger et al. 2008; Ha & Stoel 2008; Li et al. 2005; van der Heijden 2004). Perceived usefulness and ease of use were also found to have an impact on both aspects of customer loyalty. The fact that satisfaction did not have a statistically significant impact on either continuous use or purchase intentions contradicts the results of numerous earlier studies, as satisfaction has so far been seen as one of the main determinants of customer loyalty and continuous IT use (cf. Anderson & Srinivasan

2003; Bhattacherjee 2001b; Limayem et al. 2007; Oliver 1999). One explanation may be that the questions measuring satisfaction were not particularly suitable for the SVW context or the respondents.

Confirmation was found to have a rather strong influence on PU, PEOU and perceived enjoyment. Despite the fact that the influence of confirmation on satisfaction was mediated through PU, PEOU and perceived enjoyment, confirmation also had a direct impact on satisfaction. Confirmation, therefore, can also be regarded as a reasonably viable predictor of satisfaction in the SVW context.

From a managerial perspective the findings from the present study indicate that hedonic and social motives, i.e. those based on the pleasure and fun derived from engaging with an SVW as well as from the presence of relevant other people, are particularly vital to keeping the customer loyal.

5.2 Limitations and further research

The empirical data reported here represents results from an investigation of only one SVW and one country. As the targeted user groups, revenue models and geographical scopes vary between different SVWs, the motives for engagement are also likely to be diverse. In this paper we investigated Habbo, which targets mainly young people. The respondents were Canadian teenagers and thus we do not suggest that the findings can be generalised to other user groups and different online services. Moreover, since SVWs are a relatively new phenomenon in general, and only a limited amount of empirical research has been done on it, generalising from one study to the whole field of SVWs should be done with much caution. However, we do believe that the results represent Canadian Habbo users relatively well and that they may be applicable to other Habbo portals and, at least to a certain extent, to other SVWs targeting adolescents.

The relatively large number of variables and hypothesised paths may have influenced the regression weights in comparison to what might have been the case with a more parsimonious model. As the idea behind the present research model was to investigate the relationships between different constructs to uncover a new area of research, the research model serves its purpose. However, because of the low explanatory power, excluding from the research model any investigation into effects on satisfaction could be an appropriate way to refine the model.

The fact that the respondents were not randomly selected is also an issue to be considered when evaluating the results. However, since the specific aim of the paper was to investigate customer loyalty and loyal customers, the criticism could also be made that the sample of respondents may have been biased towards including more active than passive users. The bias towards the active users could have been reduced by offering incentives to the respondents. A downside to offering incentives, however, is that they may influence the motives for answering the survey and for this reason no incentives were offered.

In the present paper, perceived critical mass was investigated only as an antecedent of continuous use intention and purchase intention. However, we believe that the presence of relevant other people and the possibility to interact with them may also have an impact on other variables affecting customer loyalty. Thus, further research could investigate the influence of critical mass on other constructs, such as satisfaction, perceived enjoyment and usefulness.

Analysing similar data from different countries and comparing the results would shed light on the influence of national culture on the use of SVWs, and also further illuminate the extent to which a single survey instrument can be used in different cultural contexts. Moreover, taking demographics such as age and gender into account in the investigation could potentially provide interesting insights into the influence of the different backgrounds of users on SVW use. Finally, the findings from this study clearly indicate that the research model used requires refinement to yield better explanatory power with a smaller number of variables and hypotheses.

Appendix 1. The questionnaire

	Measurement item	Source
ATT1	Extremely negative…positive	Ajzen, 1991; Karahanna et al., 1999
ATT2	Extremely bad…good	
ATT3	Extremely dissatisfying…satisfying	
ATT4	Extremely displeasing…pleasing	
CIU1	I intend to continue using Habbo during the next three months.	Hsieh et al., 2008; Bhattacerjee, 2001
CIU2	I intend to continue using Habbo frequently during the next three months.	
PURCH1	I intend to continue purchasing Habbo items and/or Habbo Club memberships during the next three months.	Venkatesh & Davis, 2000
PURCH2	I intend to purchase Habbo items and/or Habbo Club memberships shortly.	
PURCH3	I predict I will purchase Habbo items and/ot Habbo Club memberships in the short term.	
PEOU1	Using Habbo to communicate with others is clear and understandable.	Davis, 1989; Davis et al., 1989; van der Hejden, 2004
PEOU2	Navigation through the menus and toolbars in Habbo is easy to do.	
PEOU3	I feel that Habbo's interface is easy to learn.	
PU1	Helps me stay in close touch with my friends.	
PU2	Helps me stay in close touch with people I know.	
PU3	Helps me to communicate easier with people I know.	
CON1	My use of Habbo meets my expectations.	Bhattacherjee, 2001, Oliver, 1997
CON2	My overall experience of Habbo has been better than I expected.	
CON3	Most of my expectations from using Habbo were confirmed.	
ENJ1	It is enjoyable to use Habbo.	van der Hejden 2004; Venkatesh & Brown, 2001
ENJ2	It is fun to use Habbo.	
ENJ3	It is entertaining to use Habbo.	
ENJ4	It is pleasant to use Habbo.	
CM1	How many of yours peers use Habbo? (none…all)	Hsieh et al., 2008; Markus, 1987
CM2	How people in your environment use Habbo? (none…all)	
CM3	How many people most meaningful to use use Habbo? (none…all)	

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